1   1.   A method for processing digital video signals for live video
2   applications, the method comprising:
3   providing video data comprising a plurality of frames;
4   identifying a first frame and a second frame in the frame sequences;
5   processing the information of the first frame and the information of the second
6   frame to determine a quantization step value for the second frame;
7   adjusting a transmission bit rate for the second frame in response to the
8   quantization step value.

2.   The method of claim 1 wherein the providing video data comprises:
      assigning compression modes to the frames.

3.   The method of claim 2 wherein the compression modes are selected
from a group comprising I-mode, P-mode, and B-mode.

4.   The method of claim 1 wherein the processing the information of the
first frame and the information of the second frame comprises:
      calculating a sigmaSAD value for the second frame;
      calculating a divisor value for the second frame;
      calculating the quantization step for the second frame.

1   5.   The method of claim 4 wherein the calculating a sigmaSAD value
2   comprises:
3   calculating a SAD value for each microblock of the second frame;
4   storing the SAD value in a memory unit for each microblock of the second
5   frame;
6   calculating the sum of all the SAD values for the second frame;
7   dividing the sum by the total number of microblocks of the second frame.

1   6.   The method of claim 4 wherein the calculating a divisor value
2   comprises
3   selecting a series of integers that is indexed from 0 through n-1;
4   selecting a complexity integer;
5   calculating the quotient modulo n of the complexity integer;

6.   setting the divider value equal to an integer whose index in the series equals

7   the quotient;

8   wherein n is an integer larger than 1.

1   7.   The method of claim 6 wherein the selecting a complexity integer

2   comprises:

3   if the second frame is an I-frame, setting the complexity integer near midrange

4   between an integer A and an integer B;

5   if the second frame is not an I-frame, adjusting the complexity integer so that

6   the fullness of a buffer varies toward a predefined fullness level.

1   8.   The method of claim 4 wherein the calculating the quantization step

comprises setting the quantization step equal to the sum of the ratio of the sigmaSAD value to

the divisor value, and a constant.

9.   The method of claim 8 wherein the constant equals 1.

10.   The method of claim 1 wherein the processing the information of the

first frame and the information of the second frame comprises:

deciding whether to encode a frame in the I-mode before any P-frame

encoding is accomplished.

11.   The method of claim 6 wherein the processing comprises:

Adjusting the complexity integer so that the size of encoded data for anyone of

3   the plurality of frames has approximately an equal size.

1   12.   The method of claim 1 wherein the method for processing digital video

2   signals further comprises:

3   determining the locations of I-frames in the step of providing video data;

4   extending frames immediately preceding the I-frames for one additional frame

5   time;

6   skipping frames immediately following the I-frames.

1   13.   A system including a processor for processing digital video signals for

2   live video applications, the system comprising:

3.   a memory unit within which a computer program is stored, the computer

4   program comprising:

5　　　　　　code that instructs the processor to receive video data comprising a plurality of
6　frames;
7　　　　　　code that directs the processor to identify a first frame and a second frame in
8　the frame sequences;
9　　　　　　code that directs the processor to process the information of the first frame and
10　the information of the second frame to determine a quantization step for the second frame.

1　　　　　　14.　The system of claim 13 wherein the code that directs the processor to
2　process the information of the first frame and the information of the second frame comprises:
3　　　　　　code that calculates a sigmaSAD value for the second frame;
4　　　　　　code that calculates a divisor value for the second frame;
　　　　　　code that calculates the quantization step for the second frame.

　　　　　　15.　The code of claim 14 that calculates a sigmaSAD value comprises:
　　　　　　code that calculates a SAD value for each microblock of the second frame;
　　　　　　code that stores the SAD value in a memory unit for each microblock of the
second frame;
　　　　　　code that calculates the sum of all the SAD values for the second frame;
　　　　　　code that divides the sum by the total number of microblocks of the second
frame.

　　　　　　16.　The code of claim 14 that calculates a divisor value comprises
　　　　　　code that selects a series of integers that is indexed from 0 through n-1;
3　　　　　　code that selects a complexity integer;
4　　　　　　code that calculates the quotient modulo n of the complexity integer;
5　　　　　　code that sets the divider value equal to an integer whose index in the series
6　equals the quotient;
7　　　　　　wherein n is an integer larger than 1.
1　　　　　　17.　The code of claim 16 that selects a complexity integer comprises:
2　　　　　　code that sets the complexity integer near midrange between an integer A and
3　an integer B if the second frame is an I-frame;
4　　　　　　code that adjusts the complexity integer so that the fullness of a buffer varies
5　toward a predefined fullness level if the second frame is not an I-frame.

1   18.   A system for processing digital video signals for live video

2 applications, the system comprising:

3   a video providing subsystem that provides video data comprising a plurality of

4 frames;

5   a sigmaSAD calculation subsystem that calculates a value of sigmaSAD;

6   a divisor calculation subsystem that calculates a value of divisor.

1   19.   The system of claim 18 wherein the sigmaSAD calculation subsysterm

2 comprises:

3   a subsystem that calculates a SAD value for each microblock of a frame of the

plurality of frames;

           a subsystem that stores the SAD value in a memory unit for each microblock

of the frame;

           a subsystem that calculates the sum of all the SAD values for the frame;

           a subsystem that divides the sum by the total number of microblocks of the

frame.

           20.   The system of claim 18 wherein the divisor calculation subsystem

comprises

           a subsystem that selects a series of integers that is indexed from 0 through n-1;

4   a subsystem that selects a complexity integer;

5   a subsystem that calculates the quotient modulo n of the complexity integer;

6   a subsystem that sets the divider value equal to an integer whose index in the

7 series equals the quotient;

8   wherein n is an integer larger than 1.

1   21.   The subsystem of claim 20 that selects a complexity integer comprises:

2   a subsystem that if the second frame is an I-frame, sets the complexity integer

3 near midrange between an integer A and an integer B;

4   a subsystem that if the second frame is not an I-frame, adjusts the complexity

5 integer so that the fullness of a buffer varies toward a predefined fullness level.

1   22.   The system of claim 18 further comprises:

2   a quantization step calculation subsystem that sets the quantization step equal

3 to the sum of the ratio of the value of sigmaSAD to the value of divisor, and a constant.